

REFERENCE RESOURCE CONDITIONS

This chapter develops reference conditions for various resources within the watershed. The purpose of this step in the watershed analysis process is to identify the dominant physical, biological and human components and processes active in the watershed that affect ecosystem functions or conditions.

NATURAL DISTURBANCE PROCESS

Fire

There have been no large fires in the analysis area since settlement by European Americans. Fire has been the primary large scale disturbance agent on vegetation in the Oregon Coast Range though these disturbances occur infrequently. Based on vegetation types, fire frequency is less than 50 years in the City of Corvallis ownership to 100 to 400 years in the National Forest System lands. The shorter fire frequencies may have been influenced by Native American burning along the Willamette Valley fringe. Correspondingly, fire intensity is low to mixed severity within the City of Corvallis ownership and high to mixed severity in the National Forest System lands. Low intensity and mixed severity burns would have caused a more open mature stand structure with patches of younger trees or openings. High severity fires would be stand replacing type fires (Map 11: Fire Severity). There is some evidence that a stand replacing type fire occurred somewhere between 1750 and 1800 within the National Forest System lands.

The Marys Peak fire lookout has been replaced by air and land vehicle patrols due to infrequent ignitions and prevailing low to moderate fire danger conditions. The Marys Peak repeater has important uses for fire management and the communication facilities on the top of Marys Peak are the center of this system.

Most recorded fire occurrences within the analysis area are human caused. Forest Service fire records show five human caused fires from 1975 to 1985 for a total of 95 acres burned. Most of these burned acres were caused by escaped logging slash broadcast burns. Broadcast burning of slash on the Siuslaw National Forest has virtually ended since the implementation of the Northwest Forest Plan. Most of the watershed is gated and human presence is limited which significantly lowers the risk of human caused wildfire.

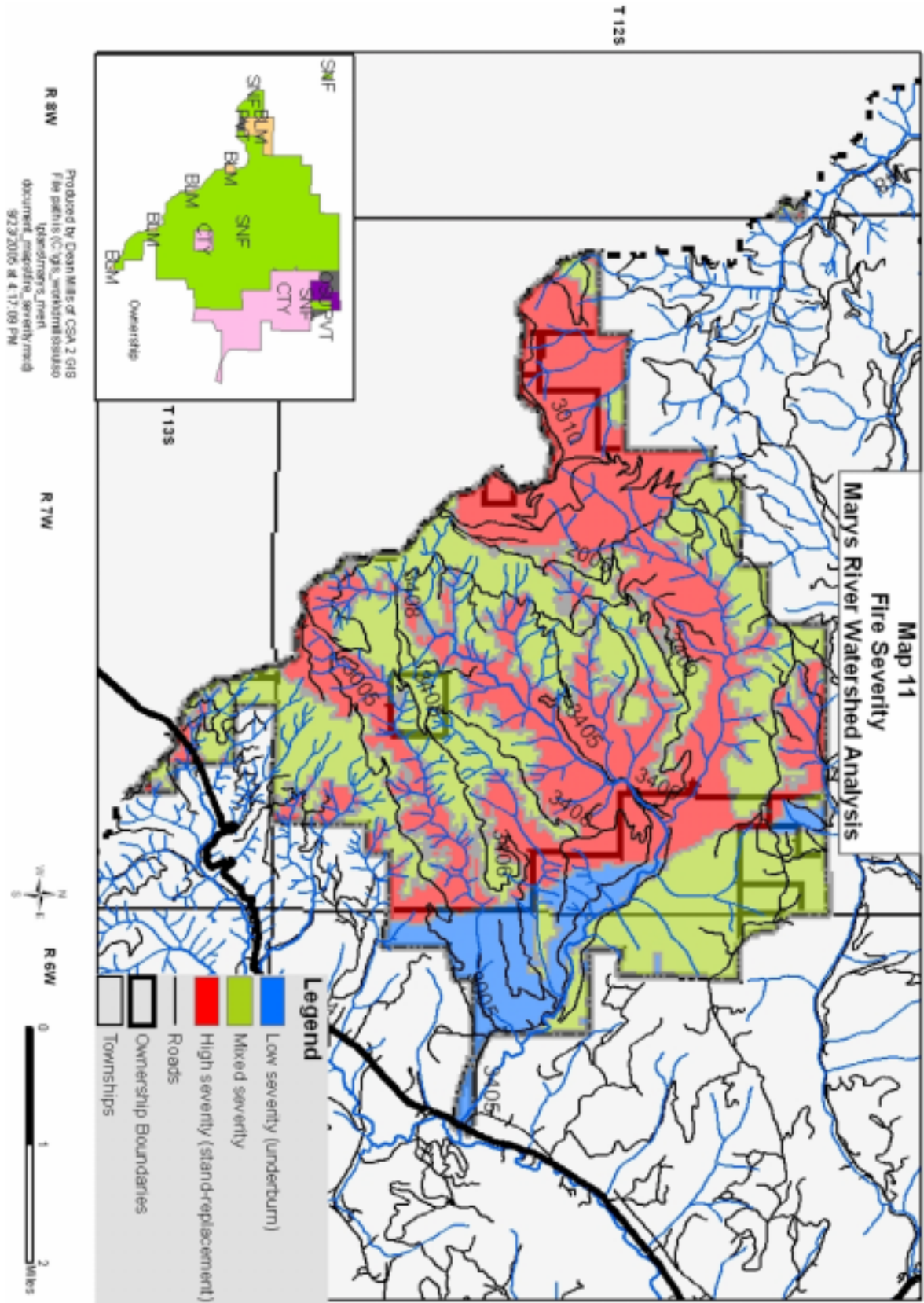
Only one lightning caused fire has been recorded on BLM land near the analysis area in 2003 for less than 1 acre burned.

Wind

Wind is a recognized disturbance factor in the Coast Range. For example, the Columbus Day Storm of 1962 caused over 30 million board feet of timber to be blown down by the violent winds in the analysis area (USDA Forest Service, 1977). Roads were blocked, drainage ditches plugged, and streams strewn with debris. Recurrence intervals are unknown.

Insects and Disease

A series of natural events began late in 1949 that changed the management of the watershed. Two winters of heavy timber windthrow, followed by a dry summer in 1951, provided optimum conditions for a Douglas-fir bark beetle epidemic which left scattered patches of dead trees throughout in the watershed. By the spring of 1952, over 60 million board feet of timber had been killed by windfall and bark beetles (USDA Forest Service, 1977).



AQUATIC COMPONENT

The efforts to protect this area as a water source for the City of Corvallis have also protected high-quality aquatic habitat throughout much of the analysis area.

Cutthroat trout are native to the all the westslope drainages of the Willamette basin and are found throughout the analysis area.

Downstream management of the Willamette River has had a dramatic impact on the aquatic species of the analysis area. Willamette Falls at Oregon City was a partial migration barrier passable at high stream flows to anadromous fish. Native winter steelhead trout were able to make it over Willamette Falls to spawn in the upriver tributaries of the Willamette because the adult fish made their spawning run in the spring during the time of high flows. Spring Chinook salmon also passed over Willamette Falls on their migration run to the tributaries of the upper Willamette. Anadromous salmonids that entered the fresh waters of the Columbia River in the fall such as Coho salmon, summer steelhead trout, and Fall Chinook were unable to pass above Willamette Falls and did not establish populations in the Willamette basin before the late 1800's.

Fish ladders were built at Willamette Falls as early as 1885 to improve access to upstream migrating fish. Coho salmon and summer steelhead trout were introduced into the Willamette Basin to take advantage of the improved access provided by fish ladders at Willamette Falls. Coho salmon introductions have not been successful at establishing a Coho fishery in the Marys River watershed.

Oregon Department of Fish and Wildlife had a very active steelhead trout stocking program throughout the Willamette Basin. Adult hatchery steelhead trout were released in the Marys River watershed from 1968 through 1973. Steelhead fry were released annually from 1985 to 1990 in the tributaries of Marys River. Winter steelhead trout are found today in the Marys River drainage and can be found on the Forest in the analysis area in South Fork Rock Creek. The genetic strain of fish returning to Rock Creek is unknown.

Releases of hatchery rainbow trout have been made throughout the Willamette basin since the 1920's to improve the sport fishery. The stocking of legal sized trout has been discontinued in the rivers of the Willamette basin. The hatchery releases did not establish a naturally producing population of resident rainbow trout.

BIOLOGICAL COMPONENT

Terrestrial Vegetation

Terrestrial vegetation patterns within the analysis area resemble drier Cascadian terrestrial vegetation patterns more than moist Coastal patterns due to the rain shadow effect that Marys Peak provides.

Many of the older trees within the watershed are approximately 200 to 250 years of age, corresponding to a stand-replacing fire between 1750 and 1800. There are places, however, where older trees can be found.

Marys Peak Meadow Complex

Natural disturbances around the Peak are primarily from wildfire and wind. A history of fire is evident in the Douglas-fir dominated stands bordering the lower elevation to the south and west margin of the complex. Survey notes from 1878 (cited in Snow 1984) recorded fire-killed timber in a large ravine in Sections 20 and 29 (possibly Parker Creek). The fire burned up the south west slope, reaching the meadows. A 1932 fire burned the south west slope of the peak, and a 1908 fire burned the north slope (Snow 1984). Drainages such as

Parker Creek also funnel wind during large wind storms, causing blow-down in the summit fir stands, as in 1962 and 1981 (Magee 1984).

Native American burning may not have played a part in the history of Marys Peak, since early seral species of cultural importance, such as huckleberries, hazel, oak, or camas, are not present in the meadow. After Euro-American settlement, the meadows were used for summer livestock range by homesteaders (Snow 1984). Later impacts of the summit included installation and maintenance of fire lookouts and communication sites. However, the major emphasis has been on recreation: hiking, picnicking, and snowplay, which briefly included a rope-tow.



Figure 4: Sept. 1969 aerial photo showing impact of Trek activities on northern portion of large (east) meadow.

In more recent history, the northern most major meadow (Trek meadow) was the site of the Shriners' Annual Marys Peak Trek (1946 to the mid-1980's); as many as 10,000 people attended the yearly one day event. The Trek event turned the meadow into a parking lot with barbeque pit, approach ramps, access road, and stage. Some mowing of the meadow also occurred.

Terrestrial Wildlife

The species that evolved in the Coast Range environment were primarily forest-dependent species. Many species, particularly large carnivores such as the grizzly bear, wolverine and wolf, inhabited the watershed prior to European American settlement, but have since been extirpated from the Coast Range.

Species strongly associated with old growth forest ecosystems were likely to have been at stable population levels during the early 1800's. Following major disturbance events, such as fire, these species would have been displaced to adjacent unburned areas, which acted as refugia while the burned areas recovered. Patch sizes (100,000 acres or more) were large enough to support stable wildlife populations over relatively long time periods.

Wetlands in the drainage were most likely very limited due to slope and topography. If they existed they were likely most prevalent in the lower portions of the watershed, where gradient was less. These areas were most likely dominated by grasses, rushes, sedges, and forbs and supported a wide variety of resident and non-resident species such as songbirds, shorebirds, waterfowl, amphibians, furbearers, bats and aquatic species. Since the Marys River watershed is part of the Pacific Flyway, any wetlands were likely used extensively for over wintering, migrating, and breeding by many species of ducks, geese, and swans.

Early seral habitat types were relatively short-lived following large fire events and generally converted back to a forested condition within 30 years. During this time period, populations of edge-associated species, such as deer, elk and grouse, likely increased and then returned back to stable levels as the forests regenerated. Historic records indicate that Roosevelt elk were abundant throughout western Oregon in the early 1800's, prior to the arrival of settlers. They were over harvested and virtually disappeared as a result of European settlement.

Many early seral associated species, as well as non-native species (plant and animal) and species which have expanded their ranges westward with settlement (i.e. opossums, red fox, barred owls, cowbirds), were uncommon or absent from the watershed prior to the mid-1800's.

HUMAN COMPONENT

Native American and Early American

Little is known about the Native American use in this portion of the Marys River watershed. The Rock Creek drainage was timbered at the time of historic settlement and limited use for hunting and subsistence gathering is expected. The local Native Americans lived along the lower elevations of Marys River in more open lands. Although Marys Peak was a known spirit quest location, little evidence of Native American activities has been found even atop the peak.

In 1906, the City of Corvallis began using water from the Rock Creek drainage which at the time was a nearly undisturbed watershed. At that time, the watershed was mostly private timber land containing no Forest Service administered public lands. In the early 1900's logging began in the Woods Creek area north of the watershed. As logging operations moved up the north slope of Marys Peak and into the watershed drainage boundary, concerned citizens began an effort to establish Rock Creek as a protected municipal watershed. By an Act of Congress in 1920, 1,720 acres of O & C reversion lands in this area transferred from the interior department to the Forest Service specifically for municipal watershed protection. The City of Corvallis had been actively purchasing land in the watershed and working to encourage the Forest Service to purchase lands for watershed protection. By the 1930's various acts of Congress had established the Marys Peak Purchase Unit and authorized a boundary change to include lands acquired by the Siuslaw National Forest. By 1940 major portions of timbered lands within the Rock Creek watershed had been purchased by either the City of Corvallis or the Forest Service. The exterior boundary of the Siuslaw National Forest was extended to include these lands.

An agreement was signed by the Secretary of Agriculture and the City of Corvallis Water Commission on February 7, 1922. This agreement included wording to limit access within the watershed as a measure to protect the water source. Some limited access for logging, research and contract forestry work has been authorized by permit but generally the road system into the watershed had remained closed to motorized use by the general public. A series of recreation trails has been constructed through the upper elevations of the watershed. The trails allow hiking and some seasonal mountain biking. Livestock is prohibited.

On June 16, 1941, the City of Corvallis leased 400 acres of land on or near the top of Marys Peak to the Siuslaw National Forest. The lease specified that the land is to be used for a public purpose. On June 30, 1941, the City of Corvallis donated to the United States 40 acres of land on the immediate top of the Peak. A fire lookout was placed on this parcel. In 1969 the lands subject to this lease were exchanged to the Forest Service with the City retaining an electronic site of 60 acres on West point.

Construction of the Marys Peak Road began in 1938 and was completed in 1941. This work was done under Depression era programs. The Marys Peak picnic ground was constructed in 1941 by the Forest Service on City land. The Lookout and observatory were constructed in 1942. This old log structure was removed and a new lookout constructed in 1959. The second lookout was destroyed in the 1962 Columbus Day storm and again replaced. The last lookout structure was removed in 1978. In 1958, the Air Force extended the road to the top of the Peak and constructed a radar filler station that was never used. Subsequently, all equipment was removed and the building transferred to the Forest Service. Since Marys Peak is the highest point in the Oregon Coast Range, it is an excellent location for

electronic equipment. At present, there are three electronic sites on Marys Peak. For security reasons, users are not listed.

The initial effort to maintain Rock Creek Watershed in a pristine condition was somewhat unsuccessful. A series of natural events began late in 1949 that changed the management of the watershed. Two winters of heavy timber windthrow, followed by a dry summer in 1951, provided optimum conditions for a Douglas-fir bark beetle epidemic which left scattered patches of dead trees throughout in the watershed.

By the spring of 1952, over 60 million board feet of timber had been killed by windfall and bark beetles. Fire hazard was increased; access was mostly undeveloped except for one fire control road accessing the lower watershed. A decision was reached to develop a salvage logging program to control the insect epidemic. Public support was solicited and received for a salvage logging program.

Plans for a salvage operation developed to halt the bark beetle epidemic and recover the value of the dead and down timber. Plans included measures to reduce the fire hazard and develop a permanent road system for future forest management. Maintaining the quality of water supplied to the City of Corvallis was first consideration in all management decisions. From the beginning, all conceivable methods of protecting the water quality and soil stability were tried. Many watershed practices, now commonplace, were first developed on Rock Creek Watershed.

The major concern for managers was maintaining stability of the soil exposed during road construction and logging. Road design and construction emphasized minimum earth movement and when excess soil was created during construction it was end hauled rather than being side cast. Roads were located as far from stream courses as possible. Cut and fill slopes were stabilized by grass seeding and straw mulch. Ditch-relief culverts of at least 15 inches in diameter and ample length were installed at frequent intervals. They were located so ditch water was spilled onto undisturbed forest floor where the silt load could filter out. Perforated pipes were used in unstable, wet areas. All road surfaces were rocked and kept well crowned by frequent maintenance to keep the surface drained.

Logging practices were designed to hold soil disturbance to a minimum. Up-hill cable logging was required on all major clearcut areas. Yarding across live streams was avoided to the fullest practical extent. Tractor logging was used as a last resort and restricted to dry conditions on gentle topography. Upon completion of logging, tractor roads were cross drained or outsloped for drainage.

Increased human activity in the watershed made sanitation restriction necessary. Three special requirements were added to all contracts. Workmen with a history of typhoid fever, amoebic dysentery, or infectious hepatitis were not to be employed. Pit privies or chemical toilets were to be required on each operation. Disposal of refuse including waste lubricants and fuels was to be in approved pits only.

Fire precautions included strict enforcement of normal requirements plus additional firefighting equipment, patrolmen, and an effective communication system. Slash was burned promptly to reduce the fire hazard and kill competing hardwood brush species. Clearcut areas were planted with Douglas-fir seedlings after slash burning.

Another storm event called "The Columbus Day Storm of 1962" altered the Rock Creek Watershed. Over 30 million board feet of timber were blown down by the violent winds. Roads were blocked, drainage ditches plugged, and streams strewn with debris. In a sense this was a repeat of the 1949 event, but this time the existence of an adequate road system enabled management to promptly respond to the situation.

Logging as part of the annual timber sale programs on the Siuslaw National Forest continued through the late 1980's and on City land as recently as 1991. Timber harvest on City lands was administered by the Forest Service under a succession of formal agreements between the Alsea Ranger District and the City of Corvallis. Implementation of the Northwest Forest

Plan designated the entire area as Late Successional Reserve halting harvest of mature timber. There has been no commercial timber harvest and other activity has been very limited since the early 1990's. Recommendations from this watershed analysis supplement may result in some short term increased activity such as commercial thinning, treatments of invasive plants, repair of selected roads and decommission of roads that have a risk of failure or are not needed for future access. Limited access and consequently low human use levels are expected to continue.

Roads

The portion of the Marys River watershed included in this analysis is comprised mostly of lands administered by the Siuslaw National Forest. The majority of those lands are managed as a municipal watershed serving the City of Corvallis. Due to the emphasis on protection of the municipal watershed, the area was not roaded until a fairly significant amount of insect killed conifer trees lead to a decision to harvest salvageable timber. This salvage effort was begun in early 1950's and was driven by a desire to protect the watershed from insect damage and potential wildfire in the dead timber.

The road system was constructed using pioneering methods to protect watershed values as roads were constructed. Roads were carefully located on the landscape to minimize the amount of soil movement required during construction. Roadcuts and fills were balanced to avoid sidecasting and excess material was hauled to stable areas and stockpiles. All roads were graveled to minimize sedimentation and bare slopes of cuts and fill were seeded and mulched. All live stream crossings had culverts installed and ditch lines had regularly spaced ditch relief culverts to minimize erosion and infiltration of sediment into the water system that was usually associated with road surfaces and ditch lines. These construction methods were not common on forest roads in the 1950's and were considered state of the art forest engineering. Many of the standards incorporated in the construction of roads within the watershed were adopted in other forest road construction after the effectiveness of these methods in reducing erosion and sedimentation was demonstrated. The fact this road system remains essentially as it was constructed in the 1950's is evidence of the effectiveness of the developing technology. Very little reconstruction has been necessary even following major storm events that have caused considerable damage to roads in other parts of the Siuslaw National Forest. This may be partially due to less rainfall on the east side of Marys Peak if compared with normal rainfall in the Coast Range west of Marys Peak.

By the early 1960's the road system had been developed to what is basically there today; only a few short logging spurs have been added since the original construction. Roads constructed earlier are the Marys Peak Road starting at the Coast Range summit on Oregon Highway 34 and initially ending at the current parking area about 9.5 miles up the peak. This road was extended the remaining one-half mile to the summit in the late 1950's. There was a road existing by about 1906 which followed Rock Creek from Highway 34 to the original impoundment for municipal water source. This road also serviced part of the water delivery pipeline from Rock Creek to Philomath. There were also some low standard logging roads built on private timberlands that have been acquired by either the Forest Service or the City of Corvallis during an aggressive land purchasing program to protect lands within the current watershed. Most of these lands were acquired between the early 1900's and 1940. A few of these older lower standard road templates still exist on the municipal watershed fringes. There are also some short segments of railroad logging grade near the northwest watershed boundary which are remnants of logging in the 1920's. Some of this railroad grade was incorporated into the current alignment of the Woods Creek Road. A portion of the Woods Creek road within the Marys River drainage and adjacent to the municipal watershed boundary is located along an historic route between Philomath and Harlan, this was an early wagon road that has been obliterated in successive developments of higher standard roads.